

Fast Acting Flow Control Valve, Phase II

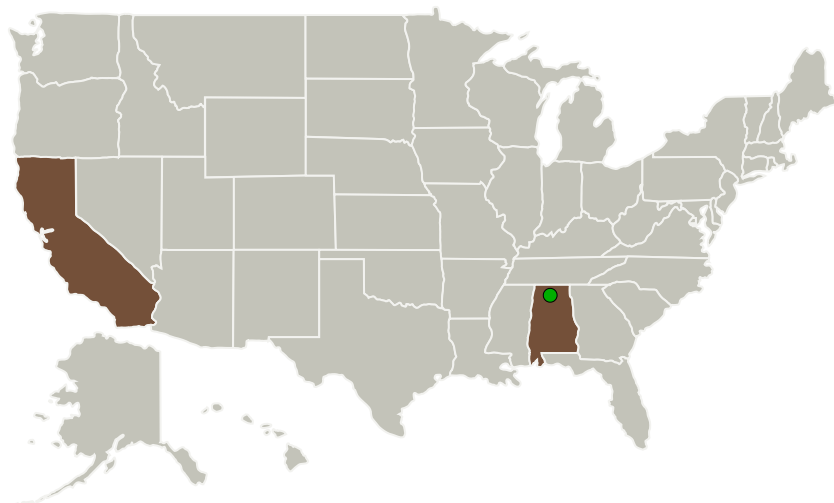
Completed Technology Project (2015 - 2017)



Project Introduction

High power electric propulsion systems have the potential to revolutionize space propulsion due to their extremely high performance. This can result in significant propellant savings on space vehicles, allowing the overall mass to shrink for launch on a less expensive vehicle or to allow the space vehicle to carry more payload at the same weight. Many of the electrical propulsion systems operate in pulse mode, pulsing hundreds or even thousands of times per second. Creating reliable valves that can operate in pulse mode for extremely long life and at low power are critical in these applications. In Phase 1 of this effort, WASK Engineering demonstrated the suitability using a piezo actuated valve to meet the requirements of electric thrusters. Valves actuated with piezo crystals offer the benefits of 1) a demonstrated ability to operate at frequencies from 0 Hz to over 1,000 Hz, 2) the ability to throttle continuously from 0-100% open, 3) extremely fast response, 4) low power usage, 5) opening the valve with infinitely variable operating waveforms, sine wave, square wave, saw tooth, custom wave form, etc., 6) no EMI generated, and 7) a very low part count for reliability

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
WASK Engineering, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Cameron Park, California
● Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations

Alabama	California
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Images

Briefing Chart

Fast Acting Flow Control Valve

Briefing Chart

(<https://techport.nasa.gov/image/134255>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

WASK Engineering, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

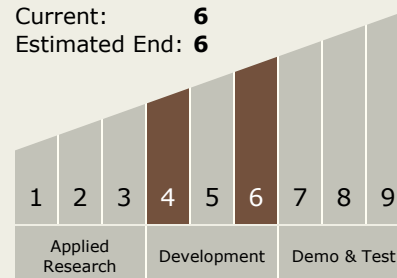
Wendel M Burkhardt

Technology Maturity (TRL)

Start: 4

Current: 6

Estimated End: 6



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Technology Areas

Primary:

- TX01 Propulsion Systems
 - └ TX01.2 Electric Space Propulsion
 - └ TX01.2.2 Electrostatic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System